Disclaimer:

This document was not produced by DEQ. Some of its content may not be in an accessible format pursuant to Section 508 of the federal Rehabilitation Act of 1973, as amended (29 U.S.C. § 794 (d)). Please call 800-592-5482 if you need assistance.

SURFACE IMPOUNDMENT CLOSURE PLAN

Possum Point Power Station – Ponds ABC and E

Permit #617

Submitted to:

Possum Point Power Station

19000 Possum Point Road

Dumfries, VA 22026

Submitted by:

Golder Associates Inc.

2108 West Laburnum Ave, Suite 200,

Richmond, Virginia 23227

804 358-7900

Project # 166-2150

May 11, 2018

Revised September 2018

Revised August 2019

Table of Contents

Tables

Attachments

1.0 PLAN CERTIFICATION

This Closure Plan for the Possum Point Power Station's Ponds ABC and E was prepared by Golder Associates Inc. (Golder). The document and Certification/Statement of Professional Opinion are based on and limited to information that Golder has relied on from Dominion Energy and others, but not independently verified, as well as work products produced by Golder.

On the basis of and subject to the foregoing, it is my professional opinion as a Professional Engineer licensed in the Commonwealth of Virginia that this document has been prepared in accordance with good and accepted engineering practices as exercised by other engineers practicing in the same discipline(s), under similar circumstances, at the same time, and in the same locale. It is my professional opinion that the document was prepared consistent with the requirements in §257.102 of the United States Environmental Protection Agency's "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments," published in the Federal Register on April 17, 2015, with an effective date of October 19, 2015 (40 CFR §257.102), as well as with the requirements in §257.100 resulting from the EPA's "Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Extension of Compliance Deadlines for Certain Inactive Surface Impoundments; Response to Partial Vacatur" published in the Federal Register on August 5, 2016 with an effective date of October 4, 2016 (40 CFR §257.100).

The use of the word "certification" and/or "certify" in this document shall be interpreted and construed as a Statement of Professional Opinion, and is not and shall not be interpreted or construed as a guarantee, warranty, or legal opinion.

Ron DiFrancesco, P. E.
Printed Name of Professional Engineer

025260
Commonwealth of Virginia License No.

Signature and Date

2.0 INTRODUCTION

This Closure Plan (Plan) was prepared for the Possum Point Power Station's (Station) inactive Coal Combustion Residuals (CCR) surface impoundments, Ponds ABC and E. This Closure Plan was prepared in accordance with 40 CFR Part §257, Subpart D and is consistent with the requirements of 40 CFR §257.102 for closure of CCR surface impoundments, 40 CFR §257.100(e)(6)(i), and Virginia Solid Waste Management Regulations 9 VAC20-81-800. The Station, owned and operated by Virginia Electric and Power Company d/b/a Dominion Energy Virginia (Dominion), is located in Dumfries, Virginia at 19000 Possum Point Road, near the mouth of Quantico Creek.

Ponds ABC and E are being closed as CCR surface impoundments under the CCR rule provisions at 40 CFR §257. The ponds will be closed by removal of CCR pursuant to 40 CFR §257.102(c). All elevations noted in this document, unless stated otherwise, are in feet relative to the North American Vertical Datum of 1988 (NAVD-88).

2.1 General Impoundment Information

Ponds ABC are approximately 15.7-acres and were used for the storage of CCR from the Station. It was built as three ponds, A, B, and C; however, the ponds shared a common downstream embankment and decant outlet structure, so they are collectively known as Ponds ABC for convenience. The embankment top elevation is 20 feet. Ponds ABC contained approximately 155,000 cubic yards (CY) of CCR prior to the start of excavation activities.

Ponds ABC is currently regulated under the following permits:

- Virginia Department of Environmental Quality (DEQ) Solid Waste Permit (SWP) No. 617
- Virginia DEQ Virginia Pollutant Discharge Elimination System (VPDES) Permit No. VA0002071
- Virginia Department of Conservation and Recreation (DCR) Operation and Maintenance Certificate, Inventory No. 153001 (Legacy No. 00788)

Pond E is an approximately 39.2-acre impoundment that was used for the storage of CCR from the Station. The embankment top elevation is 40 feet. Pond E contained approximately 730,000 CY of CCR prior to the start of excavation activities.

Pond E is currently regulated under the following permits:

- Virginia DEQ SWP No. 617
- Virginia VPDES Permit No. VA0002071
- Virginia DCR Operation and Maintenance Certificate, Inventory No. 153021 (Legacy No. 15321)

3.0 CLOSURE IMPLEMENTATION

3.1 Overview of Closure Approach

This plan provides for the closure of Ponds ABC and E by removal of the CCR material. Closure is considered complete under SWP No. 617 when:

1. A professional engineer licensed in Virginia certifies all CCR has been removed from the units followed by an over-excavation of approximately 6 inches of soil.
2. The unit's downgradient groundwater monitoring wells do not exhibit levels in excess of a maximum contaminant limit (MCL) or established groundwater protection standard for any CCR Appendix IV constituent *on or after a minimum of ten sampling events have occurred after CCR material has been verified as removed by a professional engineer licensed in Virginia.*

At the time of writing, the CCR and over-excavation in the ponds has been removed to Pond D. The pond embankments will be stabilized and the former pond subgrade will be shaped to drain through opening(s) in the embankment. Due to the breach of the embankment, the former ponds will not retain water and will no longer be regulated as impounding structures by DCR. During and after closure, the existing network of groundwater monitoring wells will be sampled and tested to determine the monitored constituent concentrations (40 CFR §257 Appendix IV).

CCRs identified in what appears to be a former laydown area west of Pond C will be removed and disposed offsite in an authorized disposal facility. This area is separate from the surface impoundments and will have dedicated erosion and sediment controls installed. After removal of these materials, a Virginia-licensed professional engineer will visually inspect the area to verify that all CCR is effectively removed.

4.0 CLOSURE TIMEFRAMES

Table 1 below outlines the estimated sequence of scheduled closure activities.

Table 1: Closure Schedule

Activity	Tentative Date
Completion of Laydown Area CCR Removal	By June 2020
Completion of Closure Construction	By September 2020
Certification of Construction Completion	By December 2020

Closure is considered complete when the elements of this Closure Plan specified above have been performed as certified by a Professional Engineer licensed in the Commonwealth of Virginia. This certification will be included as part of a closure certification report. In accordance with 40 CFR §257.102(h), Dominion will prepare a notification of closure of the CCR unit within 30 days of completion of closure, and place the notification in the operating record.

5.0 INVENTORY REMOVAL AND DISPOSAL

5.1 Waste Removal, Decontamination and Disposal

The protocol for closure by removal of Ponds ABC and E involves removing accumulated CCR such that no residual materials remain visible, followed by over-excavating the removal footprint by approximately 6 inches. Until April 29, 2019, removed CCR and CCR-mixed soil was consolidated in the Pond D CCR impoundment. Remaining CCR and CCR-mixed soil will be taken to a disposal facility. To facilitate stormwater management, construction, and/or structural stabilization of embankments or excavations, closure by removal of areas may be achieved in phases. Phased closures may be sequenced as necessary to support traffic patterns, stormwater controls, etc.

For material removal against rock, existing concrete designated to remain, or other similar hard surfaces (e.g. pipes or foundation supports to remain), the surface will be cleaned to a visually-clean condition through mechanical means such as pressure washing.

In environmentally-sensitive areas outside of the defined CCR unit boundary, such as Resource Protection Areas (RPAs), stream channels, groundwater monitoring wells, or wetlands, a modified excavation protocol will be followed for removal of identified CCR. The CCR will be removed to a visually clean condition using methods that minimize impact to surrounding soils (e.g. hand-digging around wells). The 6-inch over-excavation will not be performed in these areas in order to limit the impact to subgrade soils. Following CCR removal, the area will be stabilized to prevent erosion with material suitable for the area.

There may be instances when, during excavation near the CCR unit boundary, the CCR material is found to extend horizontally beyond the defined unit boundary and excavation cannot continue due to other permit conditions, future construction, or property access constraints. When these conditions occur, the horizontal and vertical extents of the CCR will be identified on a sketch map and photographed. Most likely, these areas will then be covered with soil to prevent commingling with cleaned areas. Once the constraining issue is resolved, Dominion will evaluate the area for management of the remaining CCR.

The former pond subgrade will be shaped to drain and openings will be made in the embankments to preclude water storage in the former pond areas. Vegetative stabilization will be established to prevent erosion. The final configuration of the design grades and embankment breach geometry will be developed through the Prince William County and DCR permitting processes. Final grades shown in the plan drawings are conceptual.

5.2 Sampling and Testing Program

After removal of the 6-inch over-excavation material from within the ponds, these areas were visually inspected to verify the CCR and over-excavation had been achieved. The ponds were further inspected by targeted soil cores for visual inspection to a depth of at least 6 inches at a frequency of at least one core

per acre. The soil cores were dug by hand using a hand auger or similar tool and were a minimum of 6-inches deep.

Verification surveys of the pond closure were prepared by a Virginia-Licensed Land Surveyor and consisted of a survey of the "visually clean" surface and a survey of the "over-excavation" surface to verify the minimum 6-inch removal. Certification of the closure by removal was provided by a Virginia-licensed Professional Engineer.

Groundwater monitoring will be conducted in accordance with the approved Groundwater Monitoring Plan to meet the closure by removal standard set forth in 40 CFR 257.102(c) and the Virginia Solid Waste Management Regulations.

5.3 Other Areas

CCRs identified in what appears to be a former laydown area west of Pond C will be removed, materials screened, and the inert materials such as concrete, asphalt, and CCR taken to an authorized disposal facility. Any remaining materials from the screening process will be disposed in an authorized disposal facility. This area is separate from the surface impoundments and will have dedicated erosion and sediment controls installed. After removal of these materials, a Virginia-licensed professional engineer will visually inspect the area to verify that all CCR is effectively removed.

6.0 CLOSURE OF SUPPORT PONDS AND BASINS

There are no supporting ponds or basins associated with Ponds ABC and E.

7.0 CLOSURE IMPLEMENTATION

7.1 Posting

One sign will be posted at the site entrance to each pond notifying all persons of the final closure and prohibition against further receipt of CCR. Unauthorized access to the site will be controlled by natural barriers or lockable gates across the access roads.

7.2 Certification

Upon completion of closure construction, a certification statement signed by a licensed professional engineer will be placed in the operating record and submitted to the DEQ along with the documentation from the Sampling and Testing Program. The certification statement shall read as follows:

> **I certify that closure has been completed in accordance with the Closure Plan dated [DATE] for solid waste permit number 617 issued to Dominion, with the exception of the following discrepancies: [To Be Determined]**

In addition, a sign(s) was (were) posted on [DATE] at the site entrance notifying all persons of the closing [and state other notification procedures if applicable] and barriers [indicate type] were installed at [location] to prevent new waste from being deposited.

[Signature, date and stamp of Professional Engineer]

7.3 Post-Closure Uses

No post-closure use of the area is proposed. The former pond areas will be allowed to revegetate and return to a natural habitat area.

8.0 COST ESTIMATE

The closure and post-removal cost estimate for Ponds ABC and E is $16,489,010. This estimated amount covers the remaining excavation, inspection, certification, monitoring, and maintenance as proposed in this Plan.

DOMINION ENERGY

POSSUM POINT POWER STATION

CLOSURE BY REMOVAL PLAN

POND ABC & POND E

SOLID WASTE PERMIT No. 617

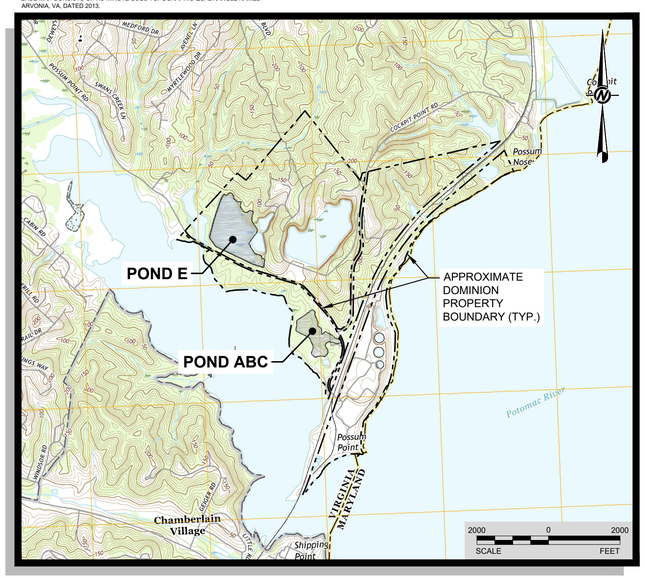
PRINCE WILLIAM COUNTY, VIRGINIA

SEPTEMBER 2018

VICINITY MAP

DRAWING INDEX	
DRAWING No.	DRAWING TITLE
CBR-1	COVER SHEET
CBR-2	POND ABC PRE-CLOSURE TOPOGRAPHY (APPROXIMATE BOTTOM OF POND)
CBR-3	POND ABC CLOSURE BY REMOVAL PLAN
CBR-4	POND ABC CONCEPTUAL FINAL GRADING PLAN
CBR-5	POND ABC CROSS-SECTIONS
CBR-6	POND E PRE-CLOSURE TOPOGRAPHY (APPROXIMATE BOTTOM OF POND)
CBR-7	POND E CLOSURE BY REMOVAL PLAN
CBR-8	POND E CONCEPTUAL FINAL GRADING PLAN
CBR-9	POND E CROSS-SECTIONS

MAP SOURCE
BASE MAP CONSISTS OF 7.5-MINUTE USGS TOPOGRAPHIC QUADRANGLE NAMED ARVONIA, VA, DATED 2013.



SITE LOCATION MAP

PREPARED BY:

GOLDER

GOLDER ASSOCIATES, INC.
MAIN CONTACT: DANIEL McGRATH, P.E.
2108 W. LABURNUM AVE., SUITE 200
RICHMOND, VIRGINIA 23227
PHONE: (804) 358-7900
EMAIL: DANIEL_McGRATH@GOLDER.COM

PREPARED FOR:

Dominion Energy℠

DOMINION ENERGY
MAIN CONTACT: MIKE GLAGOLA
5000 DOMINION BOULEVARD
GLEN ALLEN, VIRGINIA 23060
PHONE: (804) 273-4547
EMAIL: MICHAEL.A.GLAGOLA@DOMINIONENERGY.COM

REV.	MM/DD/YY	DESCRIPTION	DESIGN	CADD	CHECK	REVIEW
1	09/14/18	RESPONSE TO DEQ TR COMMENTS	DPM	BPG	ATN	DPM
0	05/07/18	ISSUED FOR PERMIT	DPM	BPG	ATN	DPM

SEAL
COMMONWEALTH OF VIRGINIA
JAMES P. DAMASCO
Lic. No. 022450
PROFESSIONAL ENGINEER
9-14-18

CLIENT
DOMINION ENERGY
POSSUM POINT POWER STATION
PRINCE WILLIAM COUNTY, VIRGINIA

CONSULTANT
GOLDER ASSOCIATES INC.
2108 WEST LABURNUM AVENUE
SUITE 200
RICHMOND, VA 23227
(804) 358-7900
www.golder.com

GOLDER

PROJECT
CLOSURE BY REMOVAL PLAN
POND ABC AND POND E
SOLID WASTE PERMIT No. 617

TITLE
COVER SHEET

PROJECT NO.
16-62150

REV. 1

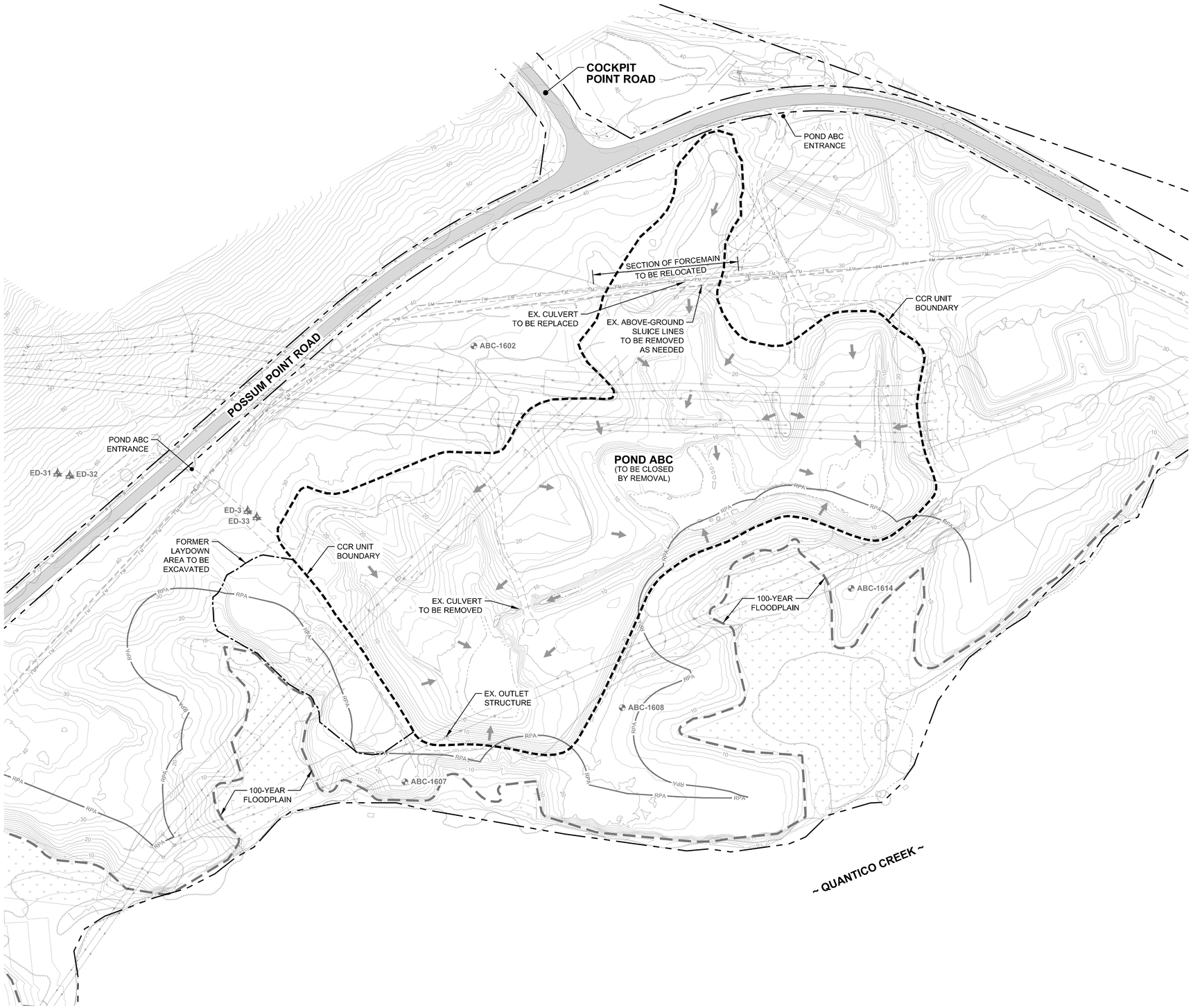
1 of 9

DRAWING
CBR-1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ARCH D

0 1 in

Path: G:\Plan Production Data Files\Drawing Data Files\16-62150\W → PONDS ABC AND E CLOSURE PLAN\Active Drawings\1662150W001.dwg



LEGEND

- DOMINION PROPERTY BOUNDARY
- CCR UNIT BOUNDARY
- EXISTING TOPOGRAPHIC CONTOURS (2' INTERVALS)
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- WETLANDS
- RESOURCE PROTECTION AREA BOUNDARY
- APPROXIMATE EDGE OF SURFACE WATER
- LIMITS OF 100-YR FLOODPLAIN
- EXISTING TREE LINE
- EXISTING OVERHEAD UTILITY LINE
- EXISTING WATER LINE
- EXISTING FORCEMAIN
- ABC-1608 — EXISTING MONITORING WELL LOCATION AND IDENTIFICATION
- ED-33 — EXISTING PIEZOMETER LOCATION AND IDENTIFICATION
- EXISTING SURFACE WATER FLOW DIRECTION

GENERAL NOTES

1. EXISTING CONDITIONS COMPILED FROM AERIAL TOPOGRAPHIC SURVEY PREPARED BY McKENZIE SNYDER, INC., DATE OF AERIAL PHOTOGRAPH: 4/28/17.
2. SITE DATUM: NAD83/NAVD88
3. WETLANDS, RESOURCE PROTECTION AREA BOUNDARY, AND 100-YEAR FLOOD PLAIN TAKEN FROM DRAWING TITLED, "EXISTING CONDITIONS PLAN," DATED 10/6/16, BY GAI CONSULTANTS, INC.
4. LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE. CONTRACTOR SHALL FIELD LOCATE ALL UNDERGROUND UTILITIES IN ADVANCE OF CONSTRUCTION AND TAKE MEASURES TO PROTECT THEM FROM DAMAGE DURING CONSTRUCTION.
5. THE MAJORITY OF WATER AND ASH HAS BEEN REMOVED FROM POND ABC, AND ONLY MANAGED CONTACT STORMWATER IS PRESENT.

REV.	DATE	DESCRIPTION	DESIGN	CADD	CHECK	REVIEW
1	09/14/18	RESPONSE TO DEQ TR COMMENTS	DPM	BPG	ATN	DPM
0	05/07/18	ISSUED FOR PERMIT	DPM	BPG	ATN	DPM

SEAL

COMMONWEALTH OF VIRGINIA
JAMES T. FRANCISCO
Lic. No. 032560
PROFESSIONAL ENGINEER
9-14-18

CLIENT
DOMINION ENERGY
POSSUM POINT POWER STATION
PRINCE WILLIAM COUNTY, VIRGINIA

CONSULTANT
GOLDER ASSOCIATES INC.
2108 WEST LABURNUM AVENUE
SUITE 200
RICHMOND, VA 23227
(804) 358-7900
www.golder.com

GOLDER

PROJECT
CLOSURE BY REMOVAL PLAN
POND ABC AND POND E
SOLID WASTE PERMIT No. 617

TITLE
POND ABC
PRE-CLOSURE TOPOGRAPHY
(APPROXIMATE BOTTOM OF POND)

PROJECT NO.
16-62150

REV. 1

2 of 9

DRAWING
CBR-2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ARCH D

0 1in

Path: G:\Plan Production Data Files\Drawing Data Files\16-62150\W - PONDS ABC AND E CLOSURE PLANS\Active Drawings\16621501W02.dwg

LEGEND

- DOMINION PROPERTY BOUNDARY
- CCR UNIT BOUNDARY
- EXISTING TOPOGRAPHIC CONTOURS (2' INTERVALS)
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- WETLANDS
- RESOURCE PROTECTION AREA BOUNDARY
- APPROXIMATE EDGE OF SURFACE WATER
- LIMITS OF 100-YR FLOODPLAIN
- EXISTING TREE LINE
- EXISTING OVERHEAD UTILITY LINE
- EXISTING WATER LINE
- EXISTING FORCEMAIN
- ABC-1608 — EXISTING MONITORING WELL LOCATION AND IDENTIFICATION
- ED-33 — EXISTING PIEZOMETER LOCATION AND IDENTIFICATION
- EXISTING SURFACE WATER FLOW DIRECTION
- APPROXIMATE CLEAN CLOSURE PHASE LIMITS (SUBJECT TO CHANGE BASED ON FIELD CONDITIONS DURING EXCAVATION AND MAY INCLUDE SUB-PHASES)
- DENOTES APPROXIMATE LIMITS OF CRITICAL AREAS SUBJECT TO BACKFILL FOR ACCESS AND SLOPE STABILITY

GENERAL NOTES

1. EXISTING CONDITIONS COMPILED FROM AERIAL TOPOGRAPHIC SURVEY PREPARED BY McKENZIE SNYDER, INC., DATE OF AERIAL PHOTOGRAPH: 4/28/17.
2. SITE DATUM: NAD83/NAVD88
3. WETLANDS, RESOURCE PROTECTION AREA BOUNDARY, AND 100-YEAR FLOOD PLAIN TAKEN FROM DRAWING TITLED, "EXISTING CONDITIONS PLAN," DATED 10/6/16, BY GAI CONSULTANTS, INC.
4. LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE. CONTRACTOR SHALL FIELD LOCATE ALL UNDERGROUND UTILITIES IN ADVANCE OF CONSTRUCTION AND TAKE MEASURES TO PROTECT THEM FROM DAMAGE DURING CONSTRUCTION.

CLOSURE BY REMOVAL NOTES

1. TOPOGRAPHY SHOWN WITHIN LIMITS OF THE PONDS REPRESENTS THE POND BOTTOM BASED ON AERIAL SURVEY BY McKENZIE SNYDER, INC. ON 4/28/17. ACTUAL FIELD CONDITIONS MAY VARY.
2. PHASED CLOSURE OF THE PONDS MAY BE SEQUENCED AS NECESSARY TO ADDRESS ISSUES RELATED TO ACCESS AND SLOPE STABILITY, AND TO MINIMIZE CONTACT STORMWATER AREAS. SUB-PHASES MAY BE REQUIRED FOR REGULATORY APPROVAL.
3. ANY AREA CERTIFIED AS ACHIEVING CLOSURE BY REMOVAL IS TO BE PROTECTED FROM CCR AND CONTACT STORMWATER, AND MAY BE FILLED AND/OR RESHAPED AS NEEDED PRIOR TO ACHIEVING FINAL GRADES.
4. ACCUMULATED CCR SHALL BE REMOVED FROM SURFACES WITHIN THE POND LIMITS SUCH THAT NO CCR REMAINS VISIBLE.
5. FOLLOWING VISUAL-CLEAN CONDITIONS, OVER-EXCAVATE THE REMOVAL FOOTPRINT BY AT LEAST SIX INCHES.
6. VISUAL INSPECTION AND TARGETED SUBGRADE VISUAL SAMPLING TO BE OVERSEEN BY OWNER'S ENGINEER REPRESENTATIVE. SAMPLING TO BE PERFORMED AT A FREQUENCY OF AT LEAST ONE TEST PER ACRE. TARGETED SAMPLING TO CONSIST OF HAND-DUG HOLES AT LEAST SIX INCHES DEEP.
7. EXCAVATION OF SLOPES STEEPER THAN 2:1 SHALL BE SEQUENCED SUCH THAT THE SLOPES CAN BE EXCAVATED, INSPECTED, AND BACKFILLED IN THE SHORTEST TIME POSSIBLE. BACKFILL SLOPES WITH CLEAN SOIL FILL AT NO STEEPER THAN 2:1.
8. EXCAVATED CCR AND SOIL-CCR MIXTURES SHALL BE CONSOLIDATED IN POND D OR TAKEN TO AN OFF-SITE DISPOSAL FACILITY AS DIRECTED BY DOMINION.

SCALE: 100 0 100 200 FEET

REV.	MM/DD/YY	DESCRIPTION	DESIGN	CADD	CHECK	REVIEW
1	09/14/18	RESPONSE TO DEQ TR COMMENTS	DPM	BPG	ATN	DPM
0	05/07/18	ISSUED FOR PERMIT	DPM	BPG	ATN	DPM

SEAL

COMMONWEALTH OF VIRGINIA — JAMES T. FRANCISCO — LIC. No. 022560 — PROFESSIONAL ENGINEER — 9-14-18

CLIENT
DOMINION ENERGY
POSSUM POINT POWER STATION
PRINCE WILLIAM COUNTY, VIRGINIA

CONSULTANT
GOLDER
GOLDER ASSOCIATES INC.
2108 WEST LABURNUM AVENUE
SUITE 200
RICHMOND, VA 23227
(804) 358-7900
www.golder.com

PROJECT
CLOSURE BY REMOVAL PLAN
POND ABC AND POND E
SOLID WASTE PERMIT No. 617

TITLE
POND ABC
CLOSURE BY REMOVAL PLAN

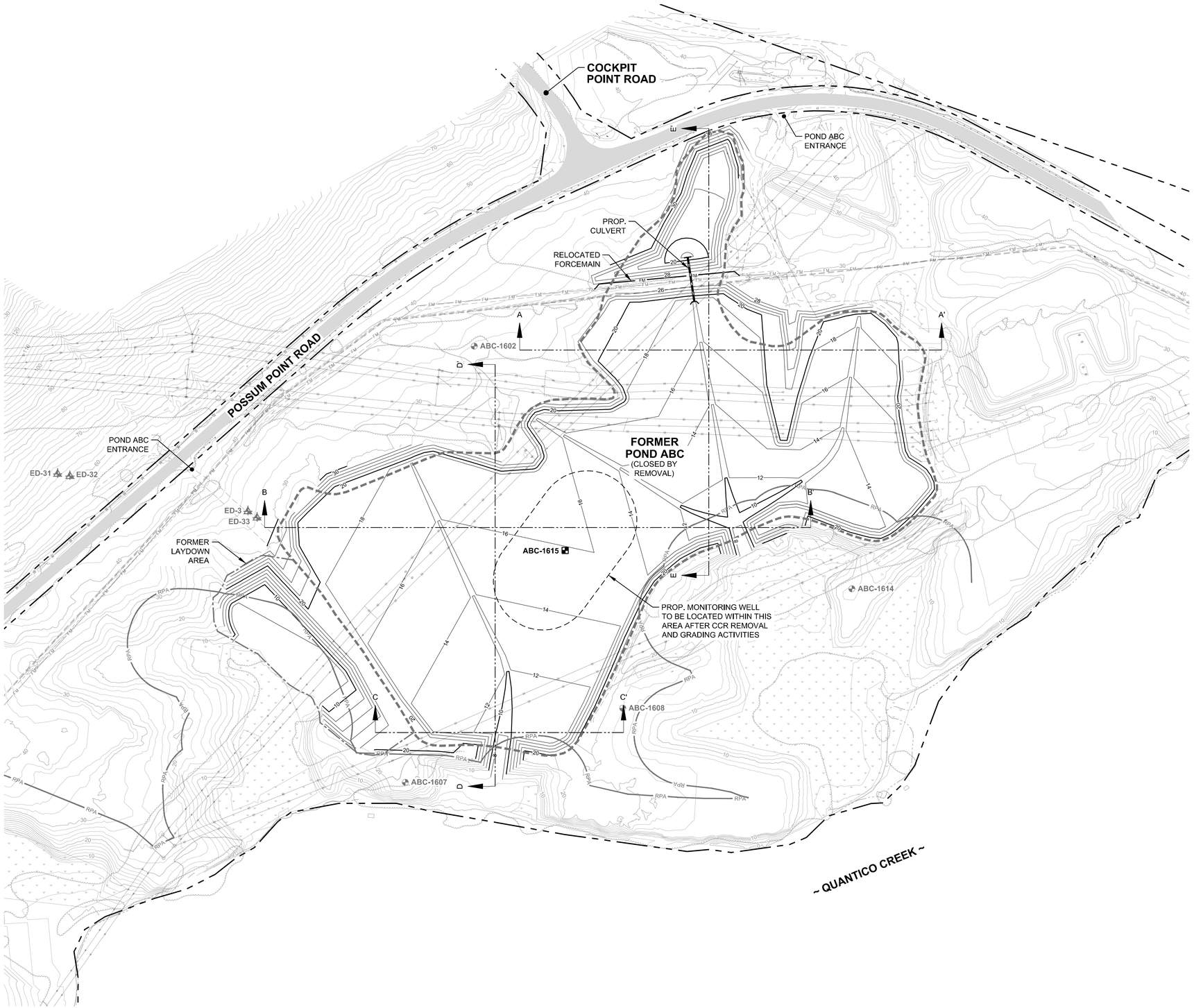
PROJECT NO.
16-62150

REV. 1 | 3 of 9 | DRAWING CBR-3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ARCH D

0 1 in

Path: G:\Plan Production Data Files\Drawing Data Files\16-62150\W - PONDS ABC AND E CLOSURE PLAN\Active Drawings\16621503W03.dwg



LEGEND

- DOMINION PROPERTY BOUNDARY
- CCR UNIT BOUNDARY
- EXISTING TOPOGRAPHIC CONTOURS (2' INTERVALS)
- CONCEPTUAL FINAL GRADE CONTOURS (2' INTERVALS)
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- WETLANDS
- RESOURCE PROTECTION AREA BOUNDARY
- APPROXIMATE EDGE OF SURFACE WATER
- EXISTING TREE LINE
- EXISTING OVERHEAD UTILITY LINE
- EXISTING WATER LINE
- EXISTING FORCEMAIN
- ABC-1608 — EXISTING MONITORING WELL LOCATION AND IDENTIFICATION
- ED-33 — EXISTING PIEZOMETER LOCATION AND IDENTIFICATION
- ABC-1615 — PROPOSED MONITORING WELL LOCATION AND IDENTIFICATION

GENERAL NOTES

1. EXISTING CONDITIONS COMPILED FROM AERIAL TOPOGRAPHIC SURVEY PREPARED BY McKENZIE SNYDER, INC., DATE OF AERIAL PHOTOGRAPH: 4/28/17.
2. SITE DATUM: NAD83/NAVD88
3. WETLANDS AND RESOURCE PROTECTION AREA BOUNDARY TAKEN FROM DRAWING TITLED, "EXISTING CONDITIONS PLAN," DATED 10/6/16, BY GAI CONSULTANTS, INC.
4. LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE. CONTRACTOR SHALL FIELD LOCATE ALL UNDERGROUND UTILITIES IN ADVANCE OF CONSTRUCTION AND TAKE MEASURES TO PROTECT THEM FROM DAMAGE DURING CONSTRUCTION.

CONCEPTUAL FINAL GRADING NOTE

1. CONCEPTUAL FINAL GRADING IS SHOWN FOR REFERENCE ONLY. THIS PLAN SHALL NOT BE IMPLEMENTED PRIOR TO PRINCE WILLIAM COUNTY SITE PLAN APPROVAL.

100 0 100 200
SCALE FEET

REV.	MM/DD/YY	DESCRIPTION	DESIGN	CADD	CHECK	REVIEW
1	09/14/18	RESPONSE TO DEQ TR COMMENTS	DPM	BPG	ATN	DPM
0	05/07/18	ISSUED FOR PERMIT	DPM	BPG	ATN	DPM

SEAL
COMMONWEALTH OF VIRGINIA
JAMES T. FRANCISCO
Lic. No. 032560
PROFESSIONAL ENGINEER
9-14-18

CLIENT
DOMINION ENERGY
POSSUM POINT POWER STATION
PRINCE WILLIAM COUNTY, VIRGINIA

CONSULTANT
GOLDER ASSOCIATES INC.
2108 WEST LABURNUM AVENUE
SUITE 200
RICHMOND, VA 23227
(804) 358-7900
www.golder.com

PROJECT
CLOSURE BY REMOVAL PLAN
POND ABC AND POND E
SOLID WASTE PERMIT No. 617

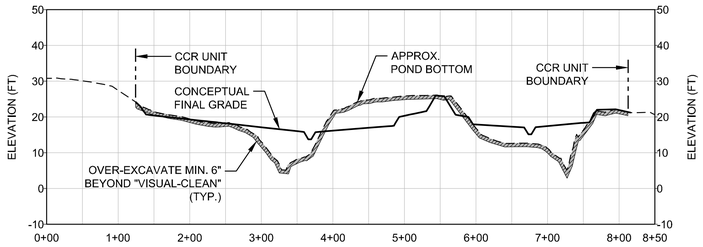
TITLE
POND ABC
CONCEPTUAL FINAL GRADING PLAN

PROJECT NO.
16-62150

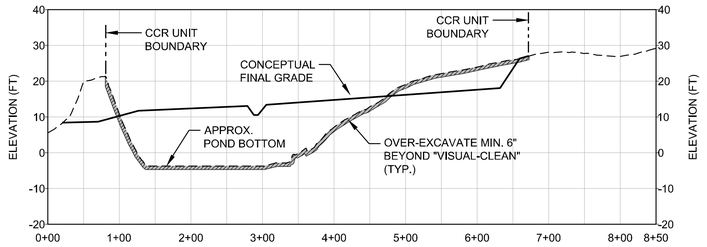
REV. 1 | 4 of 9 | DRAWING CBR-4

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ARCH D

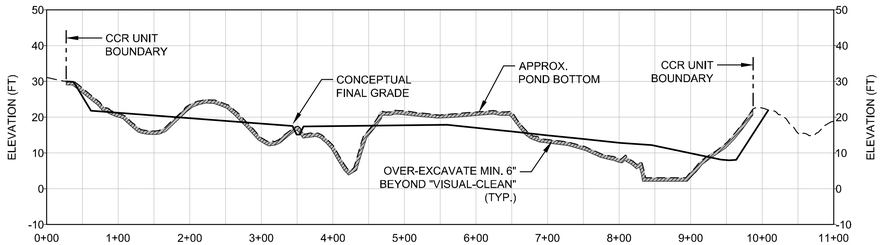
Path: G:\Plan Production Data Files\Drawing Data Files\16-62150\W - PONDS ABC AND E CLOSURE PLANS\Active Drawings\16621509W04-05.dwg



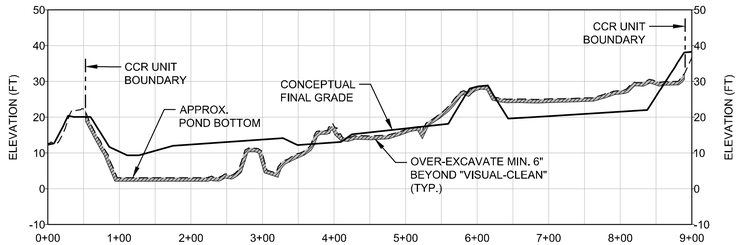
SECTION A - A'



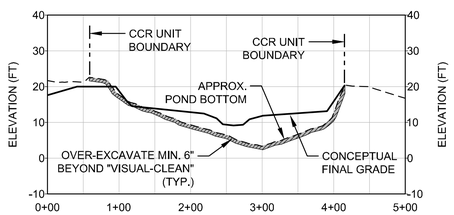
SECTION D - D'



SECTION B - B'



SECTION E - E'



SECTION C - C'

REV.	MM/DD/YY	DESCRIPTION	DESIGN	CADD	CHECK	REVIEW
1	09/14/18	RESPONSE TO DEQ TR COMMENTS	DPM	BPG	ATN	DPM
0	05/07/18	ISSUED FOR PERMIT	DPM	BPG	ATN	DPM

SEAL

COMMONWEALTH OF VIRGINIA
JAMES T. FRANCISCO
Lic. No. 022460
PROFESSIONAL ENGINEER
9-14-18

CLIENT
DOMINION ENERGY
POSSUM POINT POWER STATION
PRINCE WILLIAM COUNTY, VIRGINIA

CONSULTANT

GOLDER ASSOCIATES INC.
2108 WEST LABURNUM AVENUE
SUITE 200
RICHMOND, VA 23227
(804) 358-7900
www.golder.com

GOLDER

PROJECT
CLOSURE BY REMOVAL PLAN
POND ABC AND POND E
SOLID WASTE PERMIT No. 617

TITLE
POND ABC
CROSS-SECTIONS

PROJECT NO.
16-62150

REV.
1

5 of 9

DRAWING
CBR-5

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ARCH D

0 1 in

Path: G:\Plan Production Data Files\Drawing Data Files\16-62150\W - PONDS ABC AND E CLOSURE PLAN\Active Drawings\16l62150W04-05.dwg

LEGEND

- DOMINION PROPERTY BOUNDARY
- CCR UNIT BOUNDARY
- EXISTING TOPOGRAPHIC CONTOURS (2' INTERVALS)
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- WETLANDS
- RESOURCE PROTECTION AREA BOUNDARY
- APPROXIMATE EDGE OF SURFACE WATER
- LIMITS OF 100-YR FLOODPLAIN
- EXISTING TREE LINE
- EXISTING OVERHEAD UTILITY LINE
- EXISTING FORCEMAIN
- EXISTING WATER LINE
- ES-1609 EXISTING MONITORING WELL LOCATION AND IDENTIFICATION
- ES-4 EXISTING PIEZOMETER LOCATION AND IDENTIFICATION
- EXISTING SURFACE WATER FLOW DIRECTION

GENERAL NOTES

1. EXISTING CONDITIONS COMPILED FROM AERIAL TOPOGRAPHIC SURVEY PREPARED BY McKENZIE SNYDER, INC., DATE OF AERIAL PHOTOGRAPH: 4/28/17.
2. SITE DATUM: NAD83/NAVD88
3. WETLANDS, RESOURCE PROTECTION AREA BOUNDARY, AND 100-YEAR FLOOD PLAIN TAKEN FROM DRAWING TITLED, "EXISTING CONDITIONS PLAN," DATED 10/6/16, BY GAI CONSULTANTS, INC.
4. LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE. CONTRACTOR SHALL FIELD LOCATE ALL UNDERGROUND UTILITIES IN ADVANCE OF CONSTRUCTION AND TAKE MEASURES TO PROTECT THEM FROM DAMAGE DURING CONSTRUCTION.
5. THE MAJORITY OF WATER AND ASH HAS BEEN REMOVED FROM POND E, AND ONLY MANAGED CONTACT STORMWATER IS PRESENT.

REV.	MM/DD/YY	DESCRIPTION	DESIGN	CADD	CHECK	REVIEW
1	09/14/18	RESPONSE TO DEQ TR COMMENTS	DPM	BPG	ATN	DPM
0	05/07/18	ISSUED FOR PERMIT	DPM	BPG	ATN	DPM

SEAL

COMMONWEALTH OF VIRGINIA
JAMES T. FRANCISCO
Lic. No. 032560
PROFESSIONAL ENGINEER
9-14-18

CLIENT
DOMINION ENERGY
POSSUM POINT POWER STATION
PRINCE WILLIAM COUNTY, VIRGINIA

CONSULTANT
GOLDER

GOLDER ASSOCIATES INC.
2108 WEST LABURNUM AVENUE
SUITE 200
RICHMOND, VA 23227
(804) 358-7900
www.golder.com

PROJECT
CLOSURE BY REMOVAL PLAN
POND ABC AND POND E
SOLID WASTE PERMIT No. 617

TITLE
POND E
PRE-CLOSURE TOPOGRAPHY
(APPROXIMATE BOTTOM OF POND)

PROJECT NO.
16-62150

REV.
1

6 of 9

DRAWING
CBR-6

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ARCH D

0 1in

Path: G:\Plan Production Data Files\Drawing Data Files\16-62150\W - PONDS ABC AND E CLOSURE PLAN\Active Drawings\16621501W06.dwg

LEGEND

- DOMINION PROPERTY BOUNDARY
- CCR UNIT BOUNDARY
- EXISTING TOPOGRAPHIC CONTOURS (2' INTERVALS)
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- WETLANDS
- RESOURCE PROTECTION AREA BOUNDARY
- APPROXIMATE EDGE OF SURFACE WATER
- LIMITS OF 100-YR FLOODPLAIN
- EXISTING TREE LINE
- EXISTING OVERHEAD UTILITY LINE
- EXISTING FORCEMAIN
- EXISTING WATER LINE
- EXISTING MONITORING WELL LOCATION AND IDENTIFICATION
- EXISTING PIEZOMETER LOCATION AND IDENTIFICATION
- EXISTING SURFACE WATER FLOW DIRECTION
- APPROXIMATE CLEAN CLOSURE PHASE LIMITS (SUBJECT TO CHANGE BASED ON FIELD CONDITIONS DURING EXCAVATION AND MAY INCLUDE SUB-PHASES)
- DENOTES APPROXIMATE LIMITS OF CRITICAL AREAS SUBJECT TO BACKFILL FOR ACCESS AND SLOPE STABILITY

GENERAL NOTES

1. EXISTING CONDITIONS COMPILED FROM AERIAL TOPOGRAPHIC SURVEY PREPARED BY McKENZIE SNYDER, INC., DATE OF AERIAL PHOTOGRAPH: 4/28/17.
2. SITE DATUM: NAD83/NAVD88
3. WETLANDS, RESOURCE PROTECTION AREA BOUNDARY, AND 100-YEAR FLOOD PLAIN TAKEN FROM DRAWING TITLED, "EXISTING CONDITIONS PLAN," DATED 10/6/16, BY GAI CONSULTANTS, INC.
4. LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE. CONTRACTOR SHALL FIELD LOCATE ALL UNDERGROUND UTILITIES IN ADVANCE OF CONSTRUCTION AND TAKE MEASURES TO PROTECT THEM FROM DAMAGE DURING CONSTRUCTION.

CLOSURE BY REMOVAL NOTES

1. TOPOGRAPHY SHOWN WITHIN LIMITS OF THE PONDS REPRESENTS THE POND BOTTOM BASED ON AERIAL SURVEY BY McKENZIE SNYDER, INC. ON 4/28/17. ACTUAL FIELD CONDITIONS MAY VARY.
2. PHASED CLOSURE OF THE PONDS MAY BE SEQUENCED AS NECESSARY TO ADDRESS ISSUES RELATED TO ACCESS AND SLOPE STABILITY, AND TO MINIMIZE CONTACT STORMWATER AREAS. SUB-PHASES MAY BE REQUIRED FOR REGULATORY APPROVAL.
3. ANY AREA CERTIFIED AS ACHIEVING CLOSURE BY REMOVAL IS TO BE PROTECTED FROM CCR AND CONTACT STORMWATER, AND MAY BE FILLED AND/OR RESHAPED AS NEEDED PRIOR TO ACHIEVING FINAL GRADES.
4. ACCUMULATED CCR SHALL BE REMOVED FROM SURFACES WITHIN THE POND LIMITS SUCH THAT NO CCR REMAINS VISIBLE.
5. FOLLOWING VISUAL-CLEAN CONDITIONS, OVER-EXCAVATE THE REMOVAL FOOTPRINT BY AT LEAST SIX INCHES.
6. VISUAL INSPECTION AND TARGETED SUBGRADE VISUAL SAMPLING TO BE OVERSEEN BY OWNER'S ENGINEER REPRESENTATIVE. SAMPLING TO BE PERFORMED AT A FREQUENCY OF AT LEAST ONE TEST PER ACRE. TARGETED SAMPLING TO CONSIST OF HAND-DUG HOLES AT LEAST SIX INCHES DEEP.
7. EXCAVATION OF SLOPES STEEPER THAN 2:1 SHALL BE SEQUENCED SUCH THAT THE SLOPES CAN BE EXCAVATED, INSPECTED, AND BACKFILLED IN THE SHORTEST TIME POSSIBLE. BACKFILL SLOPES WITH CLEAN SOIL FILL AT NO STEEPER THAN 2:1.
8. EXCAVATED CCR AND SOIL-CCR MIXTURES SHALL BE CONSOLIDATED IN POND D OR TAKEN TO AN OFF-SITE DISPOSAL FACILITY AS DIRECTED BY DOMINION.

SCALE: 100 0 100 200 FEET

REV.	DATE	DESCRIPTION	DESIGN	CADD	CHECK	REVIEW
1	09/14/18	RESPONSE TO DEQ TR COMMENTS	DPM	BPG	ATN	DPM
0	05/07/18	ISSUED FOR PERMIT	DPM	BPG	ATN	DPM

SEAL
COMMONWEALTH OF VIRGINIA
JAMES T. FRANCISCO
Lic. No. 022560
PROFESSIONAL ENGINEER
5-14-18

CLIENT
DOMINION ENERGY
POSSUM POINT POWER STATION
PRINCE WILLIAM COUNTY, VIRGINIA

CONSULTANT
GOLDER
GOLDER ASSOCIATES INC.
2108 WEST LABURNUM AVENUE
SUITE 200
RICHMOND, VA 23227
(804) 358-7900
www.golder.com

PROJECT
CLOSURE BY REMOVAL PLAN
POND ABC AND POND E
SOLID WASTE PERMIT No. 617

TITLE
POND E
CLOSURE BY REMOVAL PLAN

PROJECT NO.
16-62150

REV. 1

7 of 9

DRAWING
CBR-7

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ARCH D

0 1 in

Path: G:\Plan Production Data Files\Drawing Data Files\16-62150W - PONDS ABC AND E CLOSURE PLAN\Active Drawings\1662150W07.dwg

PROP. MONITORING WELL TO BE LOCATED WITHIN THIS AREA AFTER CCR REMOVAL AND GRADING ACTIVITIES

ED-25

ES-1613

ES-1609

ES-4S

ES-4D

ES-3S

ES-3D

T-1615D

T-1615S

RPA

LEGEND

- DOMINION PROPERTY BOUNDARY
- CCR UNIT BOUNDARY
- EXISTING TOPOGRAPHIC CONTOURS (2' INTERVALS)
- CONCEPTUAL FINAL GRADE CONTOURS (2' INTERVALS)
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- WETLANDS
- RESOURCE PROTECTION AREA BOUNDARY
- APPROXIMATE EDGE OF SURFACE WATER
- EXISTING TREE LINE
- EXISTING OVERHEAD UTILITY LINE
- EXISTING WATER LINE
- EXISTING FORCEMAIN
- ES-1609 — EXISTING MONITORING WELL LOCATION AND IDENTIFICATION
- ES-4 — EXISTING PIEZOMETER LOCATION AND IDENTIFICATION
- ED-25 — PROPOSED MONITORING WELL LOCATION AND IDENTIFICATION

GENERAL NOTES

1. EXISTING CONDITIONS COMPILED FROM AERIAL TOPOGRAPHIC SURVEY PREPARED BY McKENZIE SNYDER, INC., DATE OF AERIAL PHOTOGRAPH: 4/28/17.
2. SITE DATUM: NAD83/NAVD88
3. WETLANDS AND RESOURCE PROTECTION AREA BOUNDARY TAKEN FROM DRAWING TITLED, "EXISTING CONDITIONS PLAN," DATED 10/6/16, BY GAI CONSULTANTS, INC.
4. LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE. CONTRACTOR SHALL FIELD LOCATE ALL UNDERGROUND UTILITIES IN ADVANCE OF CONSTRUCTION AND TAKE MEASURES TO PROTECT THEM FROM DAMAGE DURING CONSTRUCTION.

CONCEPTUAL FINAL GRADING NOTE

1. CONCEPTUAL FINAL GRADING IS SHOWN FOR REFERENCE ONLY. THIS PLAN SHALL NOT BE IMPLEMENTED PRIOR TO PRINCE WILLIAM COUNTY SITE PLAN APPROVAL.

N

100 0 100 200
SCALE FEET

REV.	MM/DD/YY	DESCRIPTION	DESIGN	CADD	CHECK	REVIEW
1	09/14/18	RESPONSE TO DEQ TR COMMENTS	DPM	BPG	ATN	DPM
0	05/07/18	ISSUED FOR PERMIT	DPM	BPG	ATN	DPM

SEAL

COMMONWEALTH OF VIRGINIA
JAMES T. FRANCISCO
Lic. No. 022560
PROFESSIONAL ENGINEER
9-14-18

CLIENT
DOMINION ENERGY
POSSUM POINT POWER STATION
PRINCE WILLIAM COUNTY, VIRGINIA

CONSULTANT
GOLDER

GOLDER ASSOCIATES INC.
2108 WEST LABURNUM AVENUE
SUITE 200
RICHMOND, VA 23227
(804) 358-7900
www.golder.com

PROJECT
CLOSURE BY REMOVAL PLAN
POND ABC AND POND E
SOLID WASTE PERMIT No. 617

TITLE
POND E
CONCEPTUAL FINAL GRADING PLAN

PROJECT NO.
16-62150

REV. 1

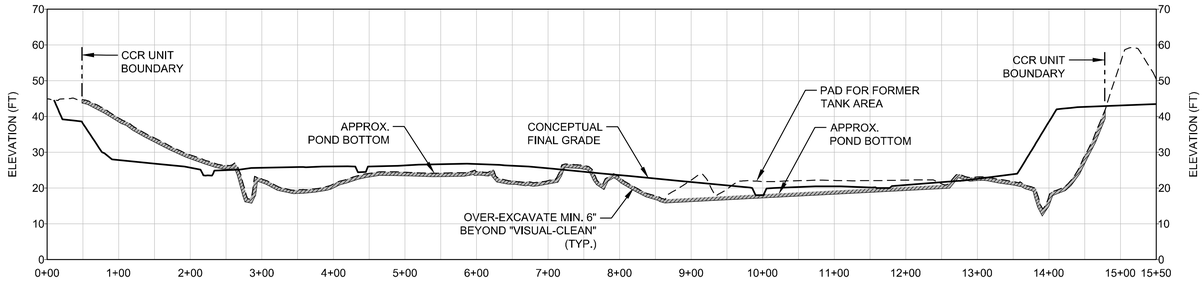
8 of 9

DRAWING
CBR-8

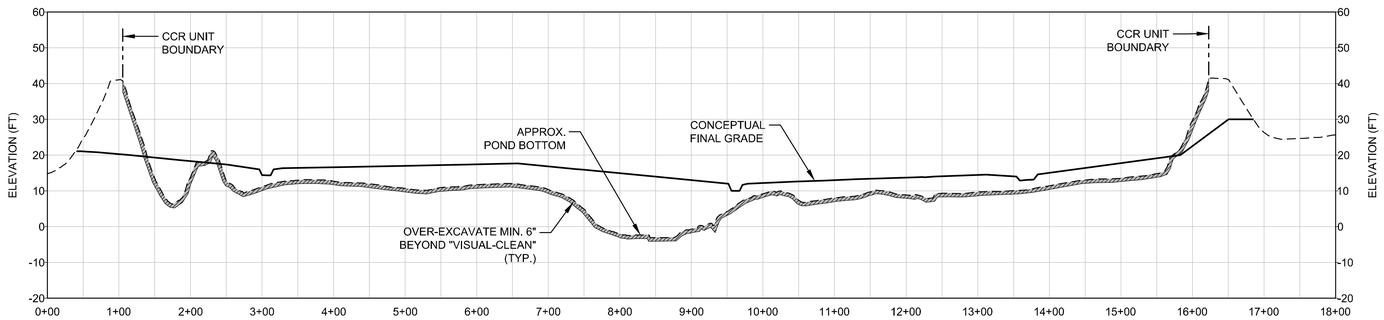
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ARCH D

0 1 in

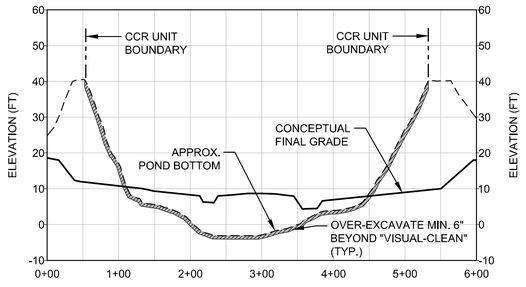
Path: G:\Plan Production Data Files\Drawing Data Files\16-62150\W - PONDS ABC AND E CLOSURE PLANA\dwg Drawings\16621509W09-09.dwg



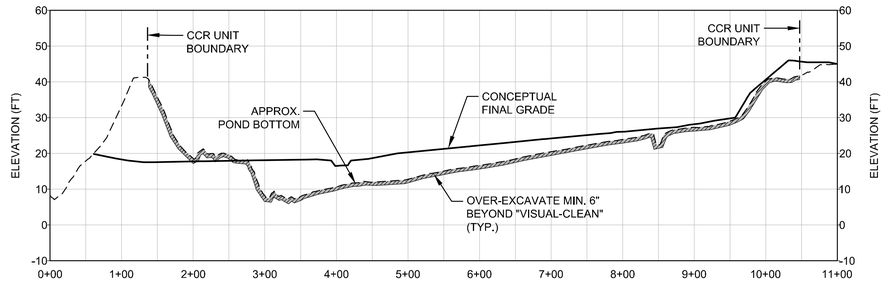
SECTION F - F'



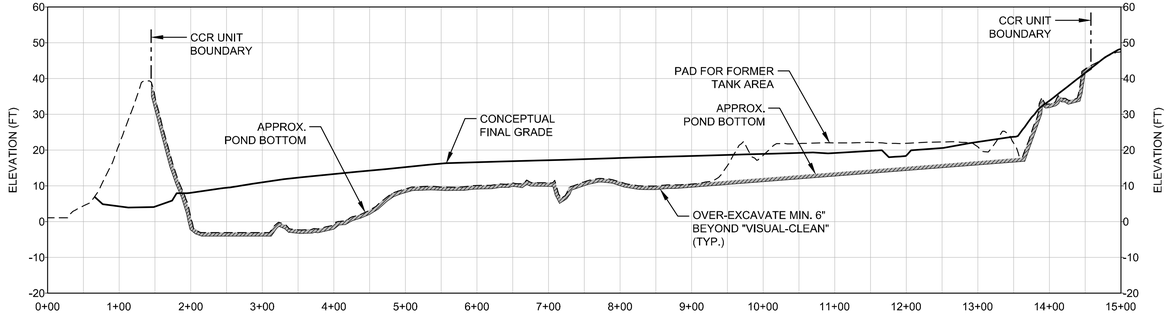
SECTION G - G'



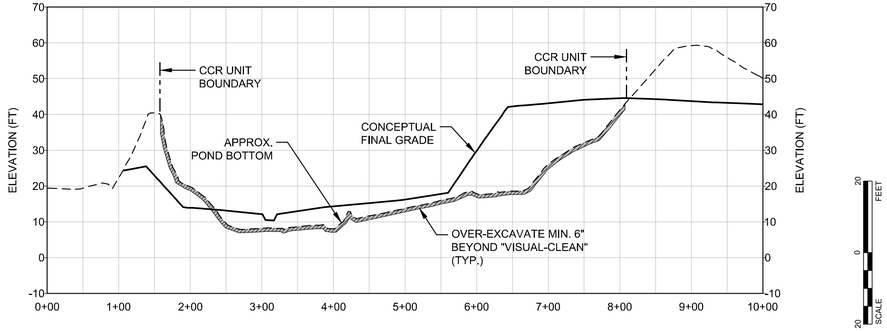
SECTION H - H'



SECTION I - I'



SECTION J - J'



SECTION K - K'

REV.	MM/DD/YY	DESCRIPTION	DESIGN	CADD	CHECK	REVIEW
1	09/14/18	RESPONSE TO DEQ TR COMMENTS	DPM	BPG	ATN	DPM
0	05/07/18	ISSUED FOR PERMIT	DPM	BPG	ATN	DPM

SEAL

COMMONWEALTH OF VIRGINIA
JAMES D. FRANCISCO
Lic. No. 032560
PROFESSIONAL ENGINEER
9-14-18

CLIENT
DOMINION ENERGY
POSSUM POINT POWER STATION
PRINCE WILLIAM COUNTY, VIRGINIA

CONSULTANT
GOLDER ASSOCIATES INC.
2108 WEST LABURNUM AVENUE
SUITE 200
RICHMOND, VA 23227
(804) 358-7900
www.golder.com

GOLDER

PROJECT
CLOSURE BY REMOVAL PLAN
POND ABC AND POND E
SOLID WASTE PERMIT No. 617

TITLE
POND E
CROSS-SECTIONS

PROJECT NO.
16-62150

REV.
1

9 of 9

DRAWING
CBR-9

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ARCH D

0 1 in

Path: G:\Plan Production Data Files\Drawing Data Files\16-62150\W - PONDS ABC AND E CLOSURE PLAN\Active Drawings\16621509W09-09.dwg

Solid Waste Disposal Facility Cost Estimate Form

Facility Name:	Possum Point Power Station CCR Impoundments			Permit No. SWP	617
Address:	19000 Possum Point Road				
City:	Dumfries	State:	VA	Zip:	22026
FA Holder:	Dominion Energy Virginia				
Estimate Prepared By:	Golder Associates Inc.				

Indicate the plan versions for which this cost estimate was prepared, identifying the following information for each plan:

Closure Plan				**Post-Closure Care Plan**			
Title:	Surface Impoundment Closure Plan			Title:	n/a		
Plan Date:	September 2018	Approved:	June 2019	Plan Date:		Approved:	
Consultant:	Golder Associates Inc.			Consultant:			
Corrective Action Plan				**Corrective Action Monitoring Plan**			
Title:	n/a			Title:	n/a		
Plan Date:		Approved:		Plan Date:		Approved:	
Consultant:				Consultant:			

Cost Estimate Summary	
Total Closure Cost:	$4,927,010
Total Post-Closure Cost:	$11,562,000
Total Corrective Action Cost:	$0
TOTAL:	**$16,489,010**

References

Please indicate references used to develop this cost estimate: Unit costs were developed from closure construction bid estimates for Dominion's CCR impoundment facilities, estimates of soil prices in the coastal Virginia area, and other landfill closure bid packages in the consultant's local area.

Certification by Preparer:

This is to certify that the cost estimates pertaining to the engineering features and monitoring requirements of this solid waste management facility have been prepared by me and are representative of the design specified in the facility's approved Closure, Post-Closure and Corrective Action Plans. The estimate is based on the cost of hiring a third party and does not incorporate any salvage value that may be realized by the sale of wastes, facility structures, or equipment, land or other facility assets at the time of partial or final closure. In my professional judgment, the cost estimates are a true, correct, and complete representation of the financial liabilities for closure, post-closure care, and corrective action of the facility and comply with the requirements of 9 VAC 20-70 and all other DEQ rules and statutes of the Commonwealth of Virginia.

Name:	Ron DiFrancesco, P.E.	Signature:	
Title:	Principal and Practice Leader	Date:	7-31-19

Acknowledgement by Owner/Operator :

Name:	Robert W. Sauer	Signature:	Robert W Sauer
Title:	Vice President System Operations	Date:	8/2/19

Possum Point Power Station Pond ABC Closure Estimate Worksheet

Excavation Components

				Calculation or Conversion	
I.	**Cover Removal**				
a.	Quantity of cover removal	0	yd3		
b.	Total cover removal unit cost	$0.00	/yd3		
	Total Cover Removal Cost			a x b	***$0***
II.	**Dewatering/Water Treatment/Testing Analysis**				
a.	Duration of dewatering/treatment/testing	0	months		
b.	Total dewatering/treatment/testing unit cost	$0.00	/month		
	Total Dewatering/Treatment/Testing Cost			a x b	***$0***
III.	**CCR Removal/Disposal**				
a.	Quantity of CCR removal	0	yd3		
b.	Total CCR removal unit cost	$0.00	/yd3		
c.	Total CCR off-site disposal unit cost	$0.00	/ton		
	Total CCR Removal/Disposal Cost			a x (b + c)	***$0***
IV.	**Overexcavation Removal/Disposal**				
a.	Quantity of overexcavation removal	0	yd3		
b.	Total overexcavation removal unit cost	$0.00	/yd3		
c.	Total overexcavation off-site disposal unit cost	$0.00	/ton		
	Total Overexcavation Cost			a x (b + (1.2c))	***$0***

Excavation Component Subtotal (I + II + III + IV): $0

Stabilization Components

V.	**Slope & Fill**				
a.	Quantity of soil needed	112,500	yd3		
b.	Total soil unit cost	$11.50	/yd3		
	Total Slope Backfill Cost			a x b	***$1,293,750***
VI.	**Vegetative Cover**				
a.	Area to be vegetated	18	acres		
b.	Vegetative cover unit cost	$3,250	/acre		
	Total Vegetative Cover Cost			a x b	***$58,500***
VII.	**Erosion/Sediment Control**				
a.	Duration of erosion/sediment control maintenance	8	months		
b.	Erosion/sediment control maintenance unit cost	$5,000.00	/month		
	Total Silt Fence Removal and Disposal Cost			a x b	***$40,000***

Stabilization Component Subtotal (V + VI + VII): $1,392,250

Miscellaneous Components

VIII. Groundwater Monitoring Well Installation

a.	Quantity of wells needed	1		
b.	Well installation unit cost	$20,000.00 /well		
	Total Groundwater Monitoring Well Installation Cost		a x b	***$20,000***

IX. Site Security

Gate or Barrier

a.	Number of gates required	1		
b.	Gate unit cost	$1,500.00 /gate		
c.	*Subtotal gate cost*		a x b	***$1,500***

Closed Sign

d.	Number of signs required	1		
e.	Sign unit cost	$1,250.00 /sign		
f.	*Subtotal sign cost*		d x e	***$1,250***
	Total site security cost		c + f	***$2,750***

X. Mobilization / Demobilization

a.	Cost for mobilization/demobilization	$179,000		
	Total mobilization/demobilization cost		TCC x 0.10	***$179,000***

Miscellaneous Component Subtotal (VIII + IX + X): $201,750

Closure Cost Subtotal (CCS):		(I + ... + X)	$1,594,000
Contingency (10%):		CCS x 0.10	$159,400
Engineering & Documentation:			
Construction QA/QC			$200,000
Construction Engineering/Surveying/Permitting			$32,000
Total Engineering & Documentation Costs			***$232,000***
Total Closure Cost (TCC):		CCS + Contingency + Engineering	**$1,985,400**

Possum Point Power Station Pond ABC Post-Removal Estimate Worksheet

			Calculation or Conversion	
I. Groundwater Monitoring				
a. Total number of monitoring wells	5	wells		
b. Total number of sampling events/year	2	events/yr	a x b	10 samples/yr
c. Quantity of additional samples (e.g. QA/QC)	2	samples/event	b x c	4 samples/yr
d. Total samples per year			b + c	14 samples/yr
e. Analysis unit cost (Table 3.1 constituents)	$1,250.00	/sample		
f. *Total Analysis cost*			d x e	*$17,500.00* /yr
g. GW Monitoring unit cost	$6,500.00	/event		
i. *Total sampling cost*			f + (g x b)	*$30,500.00* /yr
j. Engineering fees & reports	$3,000	/yr		
Yearly Groundwater Monitoring Cost			i + j	***$33,500 /yr***
II. Area Maintenance & Repair				
a. Closure Area	18	acres		
Mowing & Fertilization				
b. Mowing frequency	2	visits/yr		
c. Mowing unit cost	$500.00	/acre/visit		
d. *Total mowing cost*			a x b x c	*$18,000* /yr
e. Fertilizer frequency	1	visits/yr		
f. Fertilizer unit cost	$1,000.00	/acre/visit		
g. *Total fertilizer cost*			a x e x f	*$18,000* /yr
Erosion & Repair				
h. Area to reseed/year			33% x a	6.0 acres
i. Reseeding unit cost	$1,200.00	/acre		
j. *Total reseeding cost*			h x i	*$7,200.00* /yr
k. Area of erosion/year			10% x a	1.8 acres
l. Erosion repair unit cost	$2,500.00	/acre		
m. Mobilization/Demobilization	$500.00	/yr		
n. *Total cap erosion repair cost*			(k x l) + m	*$5,000* /yr
Yearly Area Maintenance & Repair cost			d + g + j + n	***$48,200 /yr***
III. BMP Maintenance & Repair				
a. BMP cleanout frequency, 1 per	2	years	1 / a	0.50 event/yr
b. BMP cleanout unit cost	$75,000	/event		
c. Mobilization/Demobilization	$2,500	/event		
Yearly BMP Maintenance & Repair			a x (b + c)	***$38,750 /yr***
IV. General Inspections				
a. General Inspection unit cost	$2,000	/inspection		
b. Number of inspections per year	2			
Yearly General Inspection Cost			a x b	***$4,000 /yr***

V. Surface Water Monitoring

			Calculation or Conversion	
a.	Total number of monitoring locations	1 locations		
b.	Total number of sampling events/year	4 events/yr	a x b	4 samples/yr
c.	Quantity of additional samples (e.g. QA/QC)	0 samples/event	b x c	0 samples/yr
d.	Total samples per year		b + c	4 samples/yr
e.	Analysis unit cost	$1,250.00 /sample		
f.	*Total Analysis cost*		d x e	*$5,000.00* /yr
g.	Surface Water Monitoring unit cost	$3,500.00 /event		
i.	*Total sampling cost*		f + (g x b)	*$19,000.00* /yr
j.	Engineering fees & reports	$6,250 /yr		
	Yearly Surface Water Monitoring Cost		i + j	***$25,250 /yr***

Annual Post-Removal Care Cost (APRCC)		I + ... + V	$149,700 /yr
Length of post-removal care (LPRC)	30 years		
Post-Removal Care Cost		(APRCC x LPRC)	$4,491,000
Total Post-Removal Care Cost			**$4,491,000**

Possum Point Power Station Pond E Closure Estimate Worksheet

Excavation Components

				Calculation or Conversion	
I.	**Cover Removal**				
a.	Quantity of cover removal	0	yd3		
b.	Total cover removal unit cost	$0.00	/yd3		
	Total Cover Removal Cost			a x b	***$0***
II.	**Dewatering/Water Treatment/Testing Analysis**				
a.	Duration of dewatering/treatment/testing	0	months		
b.	Total dewatering/treatment/testing unit cost	$0.00	/month		
	Total Dewatering/Treatment/Testing Cost			a x b	***$0***
III.	**CCR Removal/Disposal**				
a.	Quantity of CCR removal	0	yd3		
b.	Total CCR removal unit cost	$0.00	/yd3		
c.	Total CCR off-site disposal unit cost	$0.00	/ton		
	Total CCR Removal/Disposal Cost			a x (b + c)	***$0***
IV.	**Overexcavation Removal/Disposal**				
a.	Quantity of overexcavation removal	0	yd3		
b.	Total overexcavation removal unit cost	$0.00	/yd3		
c.	Total overexcavation off-site disposal unit cost	$0.00	/ton		
	Total Overexcavation Cost			a x (b + (1.2c))	***$0***

Excavation Component Subtotal (I + II + III + IV): $0

Stabilization Components

V.	**Slope & Fill**				
a.	Quantity of soil needed	184,900	yd3		
b.	Total soil unit cost	$11.50	/yd3		
	Total Slope Backfill Cost			a x b	***$2,126,350***
VI.	**Vegetative Cover**				
a.	Area to be vegetated	38	acres		
b.	Vegetative cover unit cost	$3,250	/acre		
	Total Vegetative Cover Cost			a x b	***$123,500***
VII.	**Erosion/Sediment Control**				
a.	Duration of erosion/sediment control maintenance	4	months		
b.	Erosion/sediment control maintenance unit cost	$5,000.00	/month		
	Total Silt Fence Removal and Disposal Cost			a x b	***$20,000***

Stabilization Component Subtotal (V + VI + VII): $2,269,850

Miscellaneous Components

VIII. Groundwater Monitoring Well Installation

a.	Quantity of wells needed	1		
b.	Well installation unit cost	$20,000.00 /well		
	Total Groundwater Monitoring Well Installation Cost		a x b	***$20,000***

IX. Site Security

Gate or Barrier

a.	Number of gates required	1		
b.	Gate unit cost	$1,500.00 /gate		
c.	*Subtotal gate cost*		a x b	***$1,500***

Closed Sign

d.	Number of signs required	1		
e.	Sign unit cost	$1,250.00 /sign		
f.	*Subtotal sign cost*		d x e	***$1,250***
	Total site security cost		c + f	***$2,750***

X. Mobilization / Demobilization

a.	Cost for mobilization/demobilization	$265,000		
	Total mobilization/demobilization cost		TCC x 0.10	***$265,000***

Miscellaneous Component Subtotal (VIII + IX + X): $287,750

Closure Cost Subtotal (CCS):	(I + ... + X)	$2,557,600
Contingency (10%):	CCS x 0.10	$255,760
Engineering & Documentation:		
Construction QA/QC		$112,250
Construction Engineering/Surveying/Permitting		$16,000
Total Engineering & Documentation Costs		***$128,250***
Total Closure Cost (TCC):	CCS + Contingency + Engineering	**$2,941,610**

Possum Point Power Station Pond E Post-Removal Estimate Worksheet

				Calculation or Conversion	
I. Groundwater Monitoring					
a. Total number of monitoring wells	10	wells			
b. Total number of sampling events/year	2	events/yr		a x b	20 samples/yr
c. Quantity of additional samples (e.g. QA/QC)	2	samples/event		b x c	4 samples/yr
d. Total samples per year				b + c	24 samples/yr
e. Analysis unit cost (Table 3.1 constituents)	$1,250.00	/sample			
f. *Total Analysis cost*				d x e	*$30,000.00* /yr
g. GW Monitoring unit cost	$14,000.00	/event			
i. *Total sampling cost*				f + (g x b)	*$58,000.00* /yr
j. Engineering fees & reports	$8,500	/yr			
Yearly Groundwater Monitoring Cost				i + j	***$66,500 /yr***
II. Area Maintenance & Repair					
a. Closure Area	38	acres			
Mowing & Fertilization					
b. Mowing frequency	2	visits/yr			
c. Mowing unit cost	$500.00	/acre/visit			
d. *Total mowing cost*				a x b x c	*$38,000* /yr
e. Fertilizer frequency	1	visits/yr			
f. Fertilizer unit cost	$1,000.00	/acre/visit			
g. *Total fertilizer cost*				a x e x f	*$38,000* /yr
Erosion & Repair					
h. Area to reseed/year				33% x a	12.7 acres
i. Reseeding unit cost	$1,200.00	/acre			
j. *Total reseeding cost*				h x i	*$15,200.00* /yr
k. Area of erosion/year				10% x a	3.8 acres
l. Erosion repair unit cost	$2,500.00	/acre			
m. Mobilization/Demobilization	$500.00	/yr			
n. *Total cap erosion repair cost*				(k x l) + m	*$10,000* /yr
Yearly Area Maintenance & Repair cost				d + g + j + n	***$101,200 /yr***
III. BMP Maintenance & Repair					
a. BMP cleanout frequency, 1 per	2	years		1 / a	0.50 event/yr
b. BMP cleanout unit cost	$75,000	/event			
c. Mobilization/Demobilization	$2,500	/event			
Yearly BMP Maintenance & Repair				a x (b + c)	***$38,750 /yr***
IV. General Inspections					
a. General Inspection unit cost	$2,000	/inspection			
b. Number of inspections per year	2				
Yearly General Inspection Cost				a x b	***$4,000 /yr***

V. Surface Water Monitoring

			Calculation or Conversion	
a.	Total number of monitoring locations	1 locations		
b.	Total number of sampling events/year	4 events/yr	a x b	4 samples/yr
c.	Quantity of additional samples (e.g. QA/QC)	0 samples/event	b x c	0 samples/yr
d.	Total samples per year		b + c	4 samples/yr
e.	Analysis unit cost	$1,250.00 /sample		
f.	*Total Analysis cost*		d x e	*$5,000.00* /yr
g.	Surface Water Monitoring unit cost	$3,500.00 /event		
i.	*Total sampling cost*		f + (g x b)	*$19,000.00* /yr
j.	Engineering fees & reports	$6,250 /yr		
	Yearly Surface Water Monitoring Cost		i + j	***$25,250 /yr***

Annual Post-Removal Care Cost (APRCC)		I + ... + V	$235,700 /yr
Length of post-removal care (LPRC)	30 years		
Post-Removal Care Cost		(APRCC x LPRC)	$7,071,000
Total Post-Removal Care Cost			**$7,071,000**

Established in 1960, Golder Associates is a global, employee-owned organization that helps clients find sustainable solutions to the challenges of finite resources, energy and water supply and management, waste management, urbanization, and climate change. We provide a wide range of independent consulting, design, and construction services in our specialist areas of earth, environment, and energy. By building strong relationships and meeting the needs of clients, our people have created one of the most trusted professional services organizations in the world.

Africa	+ 27 11 254 4800
Asia	+ 852 2562 3658
Australasia	+ 61 3 8862 3500
Europe	+ 356 21 42 30 20
North America	+ 1 800 275 3281
South America	+ 56 2 2616 2000

solutions@golder.com
www.golder.com

Golder Associates Inc.
2108 W. Laburnum Avenue, Suite 200
Richmond, VA 23227 USA
Tel: (804) 358-7900
Fax: (804) 358-2900

GOLDER

Engineering Earth's Development, Preserving Earth's Integrity